Applicant's RCE filed 9/20/11 has been studied carefully and the remarks are addressed in the rejections that follow.

Applicant has also filed an IDS on 9/20/11 with a fee of $180. Unfortunately, the copies of JP 2003-159517 and JP Utility Model 05-074627 are incomplete. As indicated on the attached initialed IDS, these incomplete materials have been considered by the examiner, but, obviously, could not be given the full consideration that would have resulted had applicant provided complete copies.

Claims 1-15, 20, 30-36 and 39 have been canceled.

Claims 16-19, 21-29, 37, 38 and 40 are pending.

Claims 21-24 and 26-29 are withdrawn from consideration.

Claims 16-19, 25, 37, 38 and 40 are examined below.

Applicant's election of Group II, claims 16-19, 25, 37, 38 and 40, without traverse, is again acknowledged. Applicant's elections of the following species, also without traverse, are again acknowledged:

Housing: Third species wherein the tubes are potted and fused to opposite ends of the housing (claims 16 and 18 deemed readable),

. Tube: Co-extruded tubes (claims 16 and 18 deemed readable),

Groove/channel: second species of Figure 2B (claim 38 deemed readable) and

Apparatus: third species of Figure 6 (claim 25 deemed readable).

In the rejections that follow the examiner makes reference to three WO publications. To aid in reading the examiner cross-references the corresponding US patents.

WO 03/029744 (Doh) is equivalent to USP 7,308,932.

USP 6,663,745 (Cheng II) is equivalent to WO 00/44480.

USP 6,582,496 (Cheng I) is equivalent to WO 00/44479.

Note copies of WO 00/44480 and WO 00/44479 were not provided with the previous office action because of their US equivalency and because applicants, their legal representatives and/or the assignees are already in possession of them. If necessary, the WO '479 and '480 publications are relied upon only for their earlier publication dates.

Claims 16-19, 25, 37, 38 and 40 are objected to because of the following informalities:

Claims 16, 19, and 38 all have at least one parenthetical recitation in them. At least once, there is an opening parenthesis with no closing parenthesis (claim 16, line

11). Please eliminate these parenthetical recitations from the claims as they add nothing to the understanding of the claims.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 16-19, 37, 38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of any one of Doh (WO 03/029744) or Cheng I (USP 6,582,496 or WO 00/44479) or Cheng II (USP 6,663,745 or WO 00/44480) and Cesaroni (USP 6,149,422) and the Solvay Solexis publication entitled "Hyflon MFA and PFA Design Guide" (Copyright 2002) and further in view of the JP 5-49875 and the translation (received 9/28/10) thereof provided by applicant.

Doh, Cheng I and Cheng II disclose essentially the same process of fusion bonding potted hollow fibers into a housing. For purposes of discussion here, Doh is discussed exclusively with the understanding that essentially the same disclosure can be found in Cheng I or Cheng II. Given applicants' familiarity with Cheng I and Cheng II as well as with Doh, no further discussion of the references to Cheng I and Cheng II is deemed necessary.

As disclosed in the "Examples" in Doh (beginning on page 15) the small tubes (on the order of 0.05 inches) can be made of MFA (Examples 1-3 and 7 in Doh) or PFA (Examples 4-6 in Doh). The housing, confusingly called a "tube" in Doh (on the order of 1 inch or more) is made of a "previously heat treated and MFA coated PFA tube" (see WO 03/029744, page 13, line 14). Thus, the large PFA tube in Doh was known to be heat treated and coated with MFA. While Doh does not state exactly why the PFA tube was coated with MFA, it stands to reason that this was done to improve bonding between the MFA potting resin (discussed below) and the PFA tubular housing since PFA has a higher melting point (300-310 degrees C) than the melting point of MFA (280-290 degrees C) as evidenced by the Solvay Solexis publication entitled "Hyflon MFA and PFA Design Guide" (Copyright 2002).

In Doh, the small tubes (either PFA or MFA) were potted with MFA resin and fused by heating for 40 hours at 275 degrees C to the housing. The small tubes (made of either MFA or PFA) in Doh were not coextruded.

Cesaroni teaches in column 2, lines 57-62:

"In [a] still further embodiment, the tube is coated with an adhesive to promote adhesion to the polymer of the article and/or said tube is a coextruded tube with the outer layer promoting bonding of said tube to the polymer of the article.

In a further embodiment, the article is part of a header or manifold for a plastic heat exchanger."

Armed with the teaching of Cesaroni, one of ordinary skill in the relevant art, at the time the invention was made, would have found it obvious to have coextruded the small PFA tubes in Doh (see Examples 4-6) with an outer layer of MFA to improve bonding of the small PFA tubes to the MFA potting resin that ultimately is cured to form the two header plates of the Doh heat exchanger. In this regard, Cesaroni explicitly teaches an art recognized equivalence of coating a tube with an adhesive and coextruding a tube with an adhesive and Doh teaches a PFA tube was known to be heat treated and coated with MFA (Doh, page 13, line 14). While Doh does not state exactly why the PFA tube was coated with MFA, it stands to reason that this was done to improve bonding between the MFA potting resin and the PFA tube since PFA has a higher melting point (300-310 degrees C) than the melting point of MFA (280-290 degrees C). Coextrusion (as disclosed by Cesaroni) has advantages over coatings (as disclosed by Doh) such as fewer concerns about uniformity caused by clogging of spray equipment where spray equipment is used to apply the coating.

Regarding claims 18 and 37, the structure above is made by the same process that applicant has disclosed, the only difference being that the small tubes are coextruded of two plastic fluorocarbon materials rather than being made of one plastic fluorocarbon material. In the absence of any test evidence to the contrary, it stands to reason that the structure above would have these claimed properties inherently since the prior art process of making a heat exchanger of one plastic fluorocarbon material is

identical to the process of making a heat exchanger of two coextruded plastic fluorocarbon materials.

Regarding claim 38, Figures 1 and 2 of JP '875 show circumferential grooves (1-1) in a housing of a plastic heat exchanger to advantageously anchor the resin that forms the header plate of the heat exchanger to the wall of the housing. To have added this feature to heat exchanger deemed obvious in the above explained rejection would have been obvious to one of ordinary skill in the art to advantageously make the heat exchanger more pressure resistant and mitigate the problem of "curing shrinkage" discussed in JP '875.

Regarding claims 18 and 37, the heat exchanger of JP '875 tested, under similar temperatures and pressures as are claimed in claims 18 and 37, in positive fashion (i.e. it did not fail). Again, there is reason to believe, in the absence of any test evidence to the contrary, that the structure deemed obvious above would have these claimed properties inherently since the JP '875 has been tested under similar conditions and found to be satisfactory. Basically, it is the examiner's considered opinion that these performance criteria would have been obvious to have met simply by choosing to put enough resin and enough grooves in the prior art structure to assure no failure even at the highest temperatures, pressures and cycle times.

Examiner's response to applicant's remarks in the response of 9/20/11:

The examiner is confused by the remarks beginning at the bottom of page 8 of the response of 9/20/11 for several reasons:

First, counsel points out that Doh doesn't disclose co-extruded thermoplastic tubes, which is correct as far as it goes, but counsel fails to acknowledge that Doh, Cheng I and Cheng II disclose essentially the same process of fusion bonding potted hollow fibers into a housing that applicant has disclosed. Critical to the invalidity of counsel's argument is the fact that the examiner never relied on Doh for a teaching of co-extruded thermoplastic tubes. Instead, the examiner relied on Cesaroni for that teaching and only that teaching.

Second, counsel goes into a long discussion of how the process of sealing the tubes (9) into the end plate (8) in Cesaroni is different from the one that applicant uses. Be that as it may, the only teaching that Cesaroni was ever relied on in the rejection was that "Cesaroni explicitly teaches an art recognized equivalence of coating a tube with an adhesive and coextruding a tube with an adhesive." Since Doh teaches a PFA tube was known to be heat treated and coated with MFA (Doh, page 13, line 14), the examiner found it to be obvious "to have coextruded the small PFA tubes in Doh (see Examples 4-6) with an outer layer of MFA to improve bonding of the small PFA tubes to the MFA potting resin that ultimately is cured to form the two header plates of the Doh heat exchanger" (emphasis supplied here). There was never any suggestion in the

examiner's rejection under 35 USC 103(a) of abandoning Doh's curing process of sealing the tubes into the end plate (i.e. the process of fusion bonding potted hollow fibers into a housing) in favor of Cesaroni's heated block process of sealing the tubes into the end plate. It is therefore submitted that counsel's discussion of how the process of sealing the tubes (9) into the end plate (8) in Cesaroni is different from the one that applicant uses is irrelevant to the issue before us because Cesaroni was never relied upon for that particular teaching. All that Cesaroni was relied upon to teach was an art recognized equivalence of coating a tube with an adhesive and coextruding a tube with an adhesive. Thus, counsel's conclusion (page 11, first paragraph, of the response of 9/20/11), even assuming it were true, that Cesaroni "could not be used to fuse the perfluorinated thermoplastic co-extruded hollow conduits or perflorinated resin with one or more structures on the interior surface of a perfluorinated housing" is submitted to be irrelevant to the issue of whether it would have been obvious to have used a coextruded tube of PFA and MFA in the Doh invention.

Third, with respect to JP '875, it is submitted that counsel is arguing (page 11, second paragraph, of the response of 9/20/11) another irrelevant fact (that the end plate in JP '875 is formed of an epoxy). As with Cesaroni, discussed above, the examiner relied on a completely different disclosure in JP '875 (i.e. the circumferential grooves (1-1) in a housing of a plastic heat exchanger that are shown in JP '875) and asserted that it would have been obvious to have used those grooves in Doh to advantageously anchor the resin of Doh that forms the header plate of the heat exchanger to the wall of

the housing. There was never any suggestion in the examiner's rejection under 35 USC 103(a) of abandoning Doh's thermoplastic resin end plate (formed by the processes set forth broadly on pages 12-13 of Doh) in favor of the epoxy one of JP '875.

Fourth, with respect to claims 18 and 37, the point argued by counsel, that the "original" design (apparently one without the grooves taught by JP '875 or the coextruded tubes of two different melting point thermoplastics) performed more poorly (integrity-wise) than a heat exchanger with those features. The examiner is not surprised by this nor does the examiner view this as evidence of unexpected results. Both modifications (that taught by Cesaroni and that taught by JP '875, as discussed by the examiner) would necessarily form a stronger heat exchanger, less likely to develop leaks, than one without these additional improving structures and nothing in applicant's test results suggest otherwise.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of any one of Doh or Cheng I or Cheng II and Cesaroni (USP 6,149,422) and the Solvay Solexis publication entitled "Hyflon MFA and PFA Design Guide" (Copyright 2002) as applied to claim 16 above, and further in view of WO 03/029775.

To have used the heat exchanger deemed obvious in the rejection of claim 16 above in place of heat exchanger 50 in Figure 1 of WO 03/029775 would have been

obvious to one of ordinary skill in the art to advantageously condition high temperature, corrosive and oxidizing process fluids without significant degradation of the heat exchanger.

With respect to this rejection, in the response of 9/20/11, applicant makes no separate argument (see page 11, last full paragraph of the response of 9/20/11) apart from those discussed above, as to whether claim 25 is obvious or not.

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN FORD whose telephone number is (571)272-4911. The examiner can normally be reached on Mon.-Fri. 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John K. Ford/
Primary Examiner, Art Unit 3784